

**INFRARED
INFORMATION
ANALYSIS CENTER**

USER'S GUIDE SUPPLEMENT

JANUARY 1993

The Infrared Information Analysis Center
Sponsored by the
Defense Technical Information Center
Cameron Station
Alexandria, VA 22304-6145
Contract No. DLA900-88-D-0392

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ERIC

P.O. Box 134001
Ann Arbor, MI 48113-4001

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USER'S GUIDE SUPPLEMENT

JANUARY 1993

The Infrared Information Analysis Center

**Environmental Research Institute of Michigan
Ann Arbor, Michigan**

**The IRIA Center is sponsored by the
Defense Technical Information Center
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INTRODUCTION

This document is a supplement to the *User's Guide* published by the Infrared Information Analysis (IRIA) Center. The *User's Guide* contains general information on the products and services offered by the IRIA Center to the infrared, electro-optical, and microwave scientific and technical communities. This Supplement adds detailed current information on IRIA staff personnel, government agencies involved in contractual or technical matters related to IRIA operations, prices of IRIA products and services, and procedures to be followed by the user in taking advantage of IRIA products and services. The *User's Guide* includes references to the section numbers of the Supplement at which specific types of information may be found.

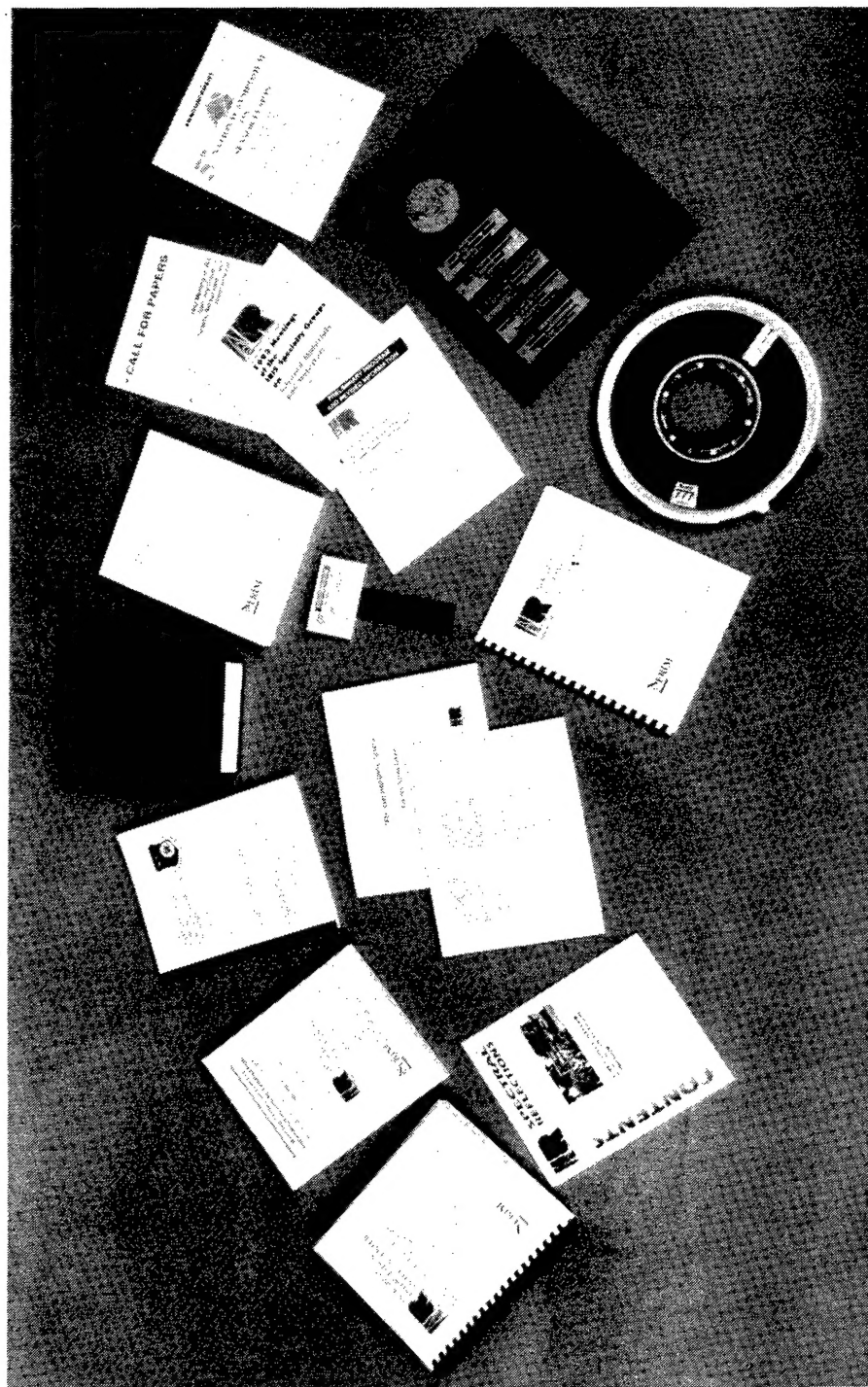
Bibliographies

Technical Reports

Infrared Handbook

Proceedings

IRIS Meetings



92-11470-25A

Newsletter

Bibliographic Searches

Data Tapes

IRIS Awards

IRIA Products and Services

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COSTS OF PRODUCTS AND SERVICES

(Effective 1 January 1993)

For detailed information on IRIA products and services, refer to the *User's Guide*. For descriptions and prices of IRIA publications, see *Supplement*, Section 3.

2.1 IRIA ANNUAL SUBSCRIPTION

<u>EO Related Sales</u>	<u>Subscription Class</u>	<u>Subscription Fee</u>	<u>Service Units</u>
Over \$100M	A	\$7,700	30
\$25M to \$100M	B	3,900	14
\$ 5M to \$ 25M	C	1,800	5
Under \$5M	D	700	1

Each service unit entitles the subscriber to discount admissions corresponding to the number of meetings held during the year. Each discount admission is valid for any meeting, allowing the subscriber greater flexibility in meeting selection. Each service unit also provides one copy of all proceedings. All subscribers are entitled to unlimited copies of IRIA's infrared and electro-optics newsletter, *Spectral Reflections*.

2.2 IRIS MEETINGS

IRIS tickets entitle the holder to reduced registration fees. Meeting tickets for all IRIS meetings will be distributed after payment of the subscription fee for the current year is received.

The basic registration fees are listed below. A site fee is added to the registration fee to cover food service and other charges characteristic of the particular meeting site and the special requests of the Program Committee.

Non-DoD Government and Subscribers With Tickets: *	\$125
Non-DoD Government and Subscribers Without Tickets: *	375
Non-subscribers:	375
All Registrants:	
Nominal Site Fee (Full Conference):	50
Nominal Site Fee (One Day):	25
Additional Proceedings:	75

* A predetermined number of tickets are issued to industrial and non-DoD Government subscribers. If you do not know who handles tickets in your organization, call the IRIA Center, (313) 994-1200, Ext. 2323.

Registration fees will be collected only at the meeting at the Cashier's Desk. Please do not mail fees in advance. If you plan to hand-carry a registration fee check, be sure to have it made payable to: ERIM. IRIS is now authorized to accept credit cards for payment of fees. The four cards accepted are: Visa, Mastercard, Diners Club, and American Express. Registrants who have forgotten to bring their tickets to the meeting must pay full rates. Tickets may be subsequently mailed to IRIA for a refund; however, there is a \$20 processing fee. The Materials and Detector meetings, which are held jointly, are considered individual meetings and tickets will be issued for each. In addition, these tickets are interchangeable so that a person may register with a single ticket and stay for both meetings.

Certain active participants in a meeting do not need subscriber tickets; it is IRIS policy to admit free of charge (except for site fees) Chairmen and Vice Chairmen of the Program Committee. Other Program Committee members and presenters will be charged a \$125 registration fee (plus site fees). Committee members and presenters receive a ticket valid for reduced registration fees.

Classified notebooks for personal notetaking are available at each IRIS meeting. They may be purchased on-site for \$25.00, including shipping and handling. They will be collected after the meeting and sent to the purchaser.

2.3 BIBLIOGRAPHIC SEARCHES

Subscribers	No charge
Non-subscribers	Contact IRIA for quotation

2.4 IRIA MAILING LIST

Requires COTR approval for sale:

Subscribers	\$300.00
Non-subscribers	400.00

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COST OF PUBLICATIONS

Orders for publications must be prepaid with checks or purchase orders made payable to ERIM. Mail to ERIM, Attention: The IRIA Center, P.O. Box 134001, Ann Arbor, MI 48113-4001. All limited documents have controlled distribution. The releasing agency is: Night Vision and Electro-Optics Directorate, ATTN: AMSEL-RD-NV-AOD-SM, Ft. Belvoir, VA 22060-5677. Use document order form (see Figure 2 of the *User's Guide*). The prices for publications quoted in this attachment include all shipping costs.

3.1 ADDITIONAL PROCEEDINGS

Industrial and non-DoD subscribers have a predetermined number of proceedings automatically sent to their organization. Automatic distribution of proceedings to DoD agencies is restricted to DoD libraries. Non-subscribers, over-quota attendees paying the full registration fee, and DoD employees will receive a personal copy without additional charge if they so designate on the registration receipt.

Attendees may order extra sets of proceedings on-site for \$75.00 per set. Orders for earlier meetings are available at the following prices.

1988 and later meetings:	\$50/volume
Previous years:	\$30/volume

Copies of individual papers are available only by ordering the proceedings volume in which they are published. Proceedings for one meeting may consist of one to four volumes. Be sure you order only the volumes you are interested in. Appropriate clearance and need-to-know are required for each volume ordered.

3.2 STATE-OF-THE-ART REPORTS

<u>Within U.S.</u>	<u>Outside U.S.</u>
Pre-1989 \$30.00 per volume	Pre-1989 \$36.00 per volume

For prices of state-of-the-art reports published after 1989 or for prices of other technical documents, see Section 3.3. See Appendix C of the *User's Guide* for IRIA reports that are available for public distribution by the National Technical Information Service (NTIS) or IRIA.

3.3 REPORTS

Handbooks

H1. *The Infrared Handbook*, W.L. Wolfe and G.J. Zissis, 1985, 1700 pp. - 25 chapters.

This classic reference work was written and edited by recognized infrared specialists, and has extensive formulary and bibliographical lists for most chapters.

H2. *The Infrared and Electro-Optical Systems Handbook*, J.S. Accetta and D.L. Shumaker, Senior Editors, 1993.

This handbook is the result of a cooperative effort by IRIA and the SPIE (The International Society for Optical Engineering). Eighty esteemed members of the IR/EO community contributed to its preparation. A total of 45 chapters comprise its eight volumes. The handbook constitutes an authoritative and up-to-date treatment of a broad field of modern technological development and military and civilian applications. The eight volumes cover (1) sources of radiation; (2) atmospheric propagation of radiation; (3) electro-optical components; (4) electro-optical system design, analysis, and testing; (5) passive electro-optical systems; (6) active electro-optical systems; (7) countermeasure systems; and (8) emerging systems and technologies. This handbook and *The Infrared Handbook* complement each other. The new handbook presents substantial material not contained in this earlier handbook, and likewise there is valuable information and data in the original handbook that is not repeated in the new publication.

H3. *Infrared Imaging Systems Analysis Handbook*, D.L. Shumaker, J.T. Wood, and C.R. Thacker, 1988.

This handbook was prepared by the DCS Corporation, Alexandria, Virginia, to serve as a guide in analyzing the performance of FLIR (Forward Looking Infrared) imaging systems. It is intended for use by engineers, scientists, and managers who may not be primarily engaged in FLIR technology development, but need to be able to analyze, measure, and/or predict the performance of FLIR systems. The text emphasizes military applications and uses military nomenclature and examples. The handbook is designed to provide, in one place, the equations and source material required to analyze most FLIR performance problems. It presents pertinent equations, gives source materials for use in equations, and provides step-by-step procedures for often-used calculations. The parameters for each equation are defined and their units are given on each page on which they appear. In addition, each parameter is cross-referenced to the text location where it is defined as a function of other parameters or described in detail. Examples illustrating the most often performed calculations are also presented as a guide for the user.

Proceedings (Other Than IRIS)

P1.3 *Proceedings of the Third National Symposium on Sensor Fusion*, held 16-20 April 1990 at the Naval Training Center, Orlando, FL.

P1.4 *Proceedings of the Fourth National Symposium on Sensor Fusion*, held 2-4 April 1991 at the Naval Training Center, Orlando, FL.

P1.5 *Proceedings of the Fifth National Symposium on Sensor Fusion*, held 21-23 April 1992 at the Naval Training Center, Orlando, FL.

The Sensor Fusion symposia were sponsored by the Office of the Undersecretary of Defense for Acquisition (Research and Advanced Technology), CECOM Night Vision and Electro-Optics Directorate, and the Defense Advanced Research Projects Agency. The program consists of papers covering developments in this emerging field presented by representatives of both government and industry with broad current experience.

P2. *1991 Conference on the Producibility of Infrared Focal Plane Array Assemblies*, June 1991, ERIM Report No. 213255-1-X.

Distribution of these proceedings is authorized to DoD agencies and DoD contractors, and, as directed by NVEOD, to other individuals or organizations. Order from the Defense Technical Information Center using the following information:

Volume I, Executive Summary, ADB 157 638L,
Volume II, Unclassified, ADB 157 669L, and
Volume III, Secret, ADC 048 450L.

Other Reports

R1. *IRIA State of the Art Report: Diffractive Optical Elements*, D.K. Angell, J.N. Cederquist, J.C. Marron, A.M. Tai, and J. Upatnieks, March 1990, Unclassified, ERIM Report No. 213400-32-T.

A comprehensive survey of the state of the art in this rapidly developing technology. The authors are staff members of ERIM's Optical and Infrared Science Laboratory who are actively engaged in the research and development of diffractive optical devices.

R2. *An IRIA Annotated Bibliography: Proceedings of the Infrared Information Symposia (IRIS) (1984-1991)*, A.J. LaRocca and I.J. Sattinger, Editors, November 1991, ERIM Report No. 213400-118-X.

This 500-page document covers almost 2500 technical papers in the proceedings of the National IRIS and the meetings of the IRIS Specialty Groups for the years 1984 to 1991. Consult this bibliography to locate IRIS papers covering a wide variety of topics related to the development and application of military infrared and electro-optic devices and systems for reconnaissance, surveillance, navigation, fire control, weapon system guidance, threat warning, and countermeasures. The bibliographic record for each paper includes bibliographic data (title, authors, date, classification, proceedings volume, and page number), information needed to order the IRIS volume from either the Defense Technical Information Center or IRIA, and a summary of the content of the paper.

R3. *Selected Papers on Targets, Backgrounds, Discrimination*, Edited by G.H. Kelley and J.S. Accetta, 1992.

This 300-page volume, intended for unlimited distribution, was edited by Mr. Gilbert H. Kelley, Grumman Aerospace Corporation, present chairman of the TBD Specialty Group of IRIS, and Dr. Joseph S. Accetta, Head, Optical and Infrared Science Laboratory, ERIM. It consists of

20 technical papers written and presented by experts from both the defense industry and Department of Defense agencies.

R4. Infrared Radiation Calculator.

This handy lightweight slide rule is a convenient way of calculating important quantities used in the design and analysis of radiation measuring and sensing systems.

3.4 DATA AVAILABLE FROM THE IRIA TARGET AND BACKGROUND DATA LIBRARY (ITBDL)

II. HICAMP II Image Data.

The HICAMP II data collection program began in 1984 and was conducted by the Lockheed Missiles and Space Company. Selections of imagery can be made from nearly 800 CCTs, and the data is also available on 11 optical disks. Auxiliary information is also supplied. The HICAMP II sensor is the second-generation mosaic focal plane array developed for DARPA. The system provides narrow band, high-resolution, multiband infrared image scenes in the short wavelength region and the long wavelength region. The telescope for each of the two arrays has provisions for seven fixed bandpass filters. The infrared scenes are spatially registered and are calibrated to provide true radiometric values. The HICAMP II system was operated from a research aircraft flying at 60,000 ft altitude. Some data is also available from the sensor while ground-based.

II. Scene Simulation Codes.

ITBDL distributes three scene simulation codes written by Photon Research Associates (PRA). PRA has developed software for target, background, and atmospheric modeling, the combined models forming a simulation of a scene similar to the HICAMP imagery.

III. Backgrounds Handbook and Computer Tape.

A source of imagery and statistical data on various types of backgrounds has been assembled. The data are presented in the *Handbook of the Statistics of Various Terrain and Water (Ice) Backgrounds From Selected U.S. Locations*, A.J. LaRocca and D.J. Witte, January 1980, Unclassified, ERIM Report No. 139900-1-X. This handbook and a computer-compatible tape based on the same data sources can be purchased. Need-to-know requirements do not apply. Both the handbook and the CCT are based on infrared imagery collected with two airborne scanners. A variety of geographical locations, seasons, and times of day is covered. The CCT contains data on 63 separate scenes. A scene is recorded as a digital quantity representing each pixel. The data can be processed to produce radiance or temperature maps of the scene. The user can also develop special programs to perform statistical analyses in addition to those included in the handbook.

For additional information on these and other data held by ITBDL, contact Ms. Sharon Chang at (313) 994-1200, Ext. 2429.

3.5 ORDERING PROCEDURE

Use the Mailing Address Form below and accompanying IRIA Products Order Form (or electronic copies of them) to place your order. Prices quoted include shipping and handling costs. All orders must be prepaid. Please make check, prepaid purchase order, or military purchase order payable to: ERIM. Mail payment to:

ERIM
Attn: The IRIA Center - DK
P.O. Box 134001
Ann Arbor, MI 48113-4001

Orders for unclassified-limited distribution or classified documents may require approval by the releasing agency, the Night Vision and Electro-Optics Directorate, Ft. Belvoir, Virginia. Obtain special order forms from IRIA if indicated by asterisks for individual products, depending on your type of organization.

Foreign orders are those requiring shipment outside North America.

For more information on individual products or on ordering procedure, contact the IRIA Center:

Telephone: (313) 994-1200, Ext. 2216

FAX: (313) 994-5550

MAILING ADDRESS

Organization: _____

Address: _____

City _____ State _____ ZIP _____

ATTN: _____

Telephone: _____

IRIA Subscriber or DoD Agency? Yes _____ No _____

IRIA PRODUCTS ORDER FORM					
Item	Price (\$)			Quantity	Total
	Indiv.	Subscriber	Foreign		
Handbooks					
H1. Infrared Handbook	75.00	60.00	90.00		
H2. Infrared and Electro-Optical Systems Handbook (Eight-Volume Set)					
Individual:	252.00		264.00		
Subscriber:		205.00	215.00		
H3. Infrared Imaging Systems Analysis Handbook					
Individual:	98.00		103.00		
Subscriber:		88.00	93.00		
Proceedings (Other Than IRIS)					
P1. Sensor Fusion Symposium Proceedings					
P1.3. Third Symposium					
Volume I (Unclassified)*	55.00				
Volume II (Secret-Noform)**	30.00				
Two-Volume Set**	75.00				
P1.4. Fourth Symposium					
Volume I (Unclassified)*	55.00				
Volume II (Secret-Noform)**	30.00				
Two-Volume Set**	75.00				
P1.5. Fifth Symposium					
Volume I (Unclassified)*	55.00				
Volume II (Secret-Noform)**	30.00				
Two-Volume Set**	75.00				
Other Reports					
R1. State-of-the-Art Report on Diffractive Optical Elements	75.00	55.00	85.00		
R2. Annotated Bibliography of IRIS Proceedings*	125.00	95.00			
R3. Selected Papers on Targets, Backgrounds, and Discrimination	75.00	55.00	85.00		
R4. Infrared Radiation Calculator					
Each:	8.00		10.00		
Order Over 9:	6.00				
IRIA Target and Background Data Library					
I1. HICAMP II Image Data (documentation included)					
First CCT	250.00				
Additional CCTs, each	130.00				
First Videotape, each	130.00				
Additional Videotapes	90.00				
I2. PRA Codes (Documentation Included)					
APART	250.00				
GENESIS	200.00				
TARSIS	250.00				
Package of above 3 codes	600.00				
I3. Handbook of Background Statistics	75.00				
Computer Tape of Background Data (Including Handbook)	350.00				
I4. CREEP Coating Reflectance Code	250.00				
				Total	

*Non-IRIA Subscribers: Contact IRIA for special order form.

**All Purchasers: Contact IRIA for special order form.

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ORGANIZATIONS AND PERSONNEL

4.1 IRIA CENTER STAFF

The IRIA Center facility is located at 1968 Green Road in Ann Arbor, Michigan. Mailing address: The IRIA Center, ERIM, P.O. Box 134001, Ann Arbor, MI 48113-4001. Telephone: (313) 994-1200, Ext. 2215. FAX: (313) 994-5550.

The IRIA Center staff can be reached at (313) 994-1200, Ext. 2215, 8:00 a.m. to 5:00 p.m. Eastern Time, Monday through Friday. For information about the subject areas listed below, feel free to contact the appropriate staff member directly.

<u>Name/Position</u>	<u>Phone Extension</u>	<u>Internet/ Milnet E-Mail</u>	<u>Subject</u>
Rodney C. Anderson IRIA Director	2725	anderson@erim.org	Technical Area Tasks
David L. Shumaker Deputy Director for IRIS	2215		IRIS Matters
Kathleen A. Figurski IRIA Center Administrator	2733	figurski@erim.org	Program Management
Nancy A. Hall Administrative Secretary	2215	hall@erim.org	General Information
Anthony J. LaRocca Technical Staff	2302	larocca@erim.org	Technical Inquiries, Bibliographies
Irvin J. Sattinger Technical Staff and Technical Editor, <i>Spectral Reflections</i>	2245	sattinger@erim.org	Technical Inquiries, Bibliographies, IRIA Newsletter
Rose M. Coleman Conference Coordinator	2881	iris@erim.org	Meetings, Conferences, and Workshops
Colleen Richmond Assistant Conference Coordinator	2821	iris@erim.org	Meetings, Conferences, and Workshops
Ruth L. Chatton Information Specialist	2323	chatton@erim.org	Librarian, Subscriptions
Elizabeth Williams IRIS Editor	2526	lwilliams@erim.org	Proceedings Editing
Sharon O. Chang Data Services Coordinator	2429	chang@erim.org	IRIA Target and Background Data Library - Orders
Daniel Kennard Classified Material Specialist	2216	kennard@erim.org	Proceedings Distribution, Document Orders

4.2 CONTRACT ADMINISTRATION ORGANIZATIONS

Program Manager

Defense Technical Information Center
ATTN: DTIC-AI (Dr. Forrest R. Frank)
Cameron Station
Alexandria, VA 22304-6145
Telephone: Commercial (703) 274-6260
DSN 284-6260
FAX: (703) 274-0980

Contracting Officer

Commander
Defense Electronics Supply Center
ATTN: DESC/PSC (Ms. Cheryl Montoney)
Dayton, OH 45444-5208
Telephone: Commercial (513) 296-6671
DSN 986-6671

Ms. Debra Collins is the Contract Specialist for the IRIA contract.
Telephone: Commercial (513) 296-5344
DSN 986-5344
FAX: (513) 296-8691

Contracting Officer's Technical Representative (COTR)

Dr. John M. MacCallum
Staff Specialist for Electronic Sensors and Devices
ODDR&E/AT
Room 3D1089, The Pentagon
Washington, DC 20301-3080
Telephone: Commercial (703) 695-0005
DSN 225-0005
FAX: (703) 695-4885

IRIA Center Director

ERIM/IRIA Center
ATTN: Dr. Rodney C. Anderson
P.O. Box 134001
Ann Arbor, MI 48113-4001
Telephone: Commercial (313) 994-1200, Ext. 2725
FAX: (313) 994-5550
E-Mail: anderson@erim.org

IRIA Center Administrator

ERIM/IRIA Center
ATTN: Ms. Kathleen A. Figurski
P.O. Box 134001
Ann Arbor, MI 48113-4001
Telephone: Commercial (313) 994-1200, Ext. 2733
FAX: (313) 994-5550
E-Mail: figurski@erim.org

Security Manager for the IRIA Center

Night Vision and Electro-Optics Directorate
ATTN: AMSEL-RD-NV-AOD-SM
Ft. Belvoir, VA 22060-5677

The Security Manager is Ms. Sheila Dodd
Telephone: Commercial (703) 704-1134
DSN 654-1134
FAX: (703) 704-1098

4.3 DEFENSE TECHNICAL INFORMATION CENTER UNITS

DTIC Address

Defense Technical Information Center
Building #5, Cameron Station
Alexandria, VA 22304-6145

DTIC Unit

Telephone or FAX Number

Directorate of User Services
ATTN: DTIC-BLS

Commercial (703) 274-3848
DSN 284-3848

Administrator
ATTN: DTIC-AI

Commercial (703) 274-6260
DSN 284-6260

Registration Branch
ATTN: DTIC-BCS

Commercial (703) 274-6871
DSN 284-6871

IAC Program Manager
(Dr. Forrest R. Frank)
ATTN: DTIC-AI

Commercial (703) 274-6260
DSN 284-6260
FAX: (203) 274-0980

4.4 IRIS SPECIALTY GROUP CHAIRMEN

Chairman, IRIS

John M. MacCallum
ODDR&E/AT, Washington, DC
Telephone: Commercial (703) 695-0005
DSN 225-0005
FAX: (703) 695-4885

Deputy Director for IRIS

David L. Shumaker
Environmental Research Institute of Michigan, Ann Arbor, MI
Telephone: (313) 994-1200, Ext. 2215
or
(813) 743-9584
FAX: (813) 625-5389

IRIS Specialty Group Chairmen

Active Systems

Albert Jelalian
Jelalian Science and Engineering
Telephone: (617) 271-0208
FAX: (617) 271-0209

Infrared Countermeasures

Frank Barone
Naval Research Laboratory
Telephone: (202) 767-2115
DSN 297-2115
FAX: (202) 767-9203

Infrared Detectors

Joseph Killiany
Naval Research Laboratory
Telephone: (202) 767-2524
DSN 297-2524
FAX: (202) 767-0546

Infrared Materials

William Tennant
Rockwell International Science Center
Telephone: (805) 373-4247
FAX: (805) 373-4775

Passive Sensors

Michael Cantella
Massachusetts Institute of Technology Lincoln Laboratory
Telephone: (617) 981-7965
FAX: (617) 981-0969

Targets, Backgrounds, and Discrimination

Gilbert H. Kelley
Grumman Aerospace Corporation
Telephone: (516) 575-2344
FAX: (516) 575-7428